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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/894,728	06/28/2001	Hassan S. Hashemi	00CON159PC-CIP4	9014

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EXAMINER

CRUZ, LOURDES C

ART UNIT PAPER NUMBER

2827

DATE MAILED: 04/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/894,728

Applicant(s)

HASHEMI ET AL.

Examiner

Lourdes C. Cruz

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

All figures showing cross-sectional views of the invention are improperly crosshatched. All of the cross hatching patterns should be selected from those shown on page 600-81 of the MPEP based on the material of the part. Also see 35 CFR 184 (h)(3) and MPEP 608.02.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Selna (US 5640048) in view of Terasawa (US5942797).

Selna discloses (See cover Fig.) a structure comprising:

A substrate 52,54 having a top surface for receiving a chip 12; a printed circuit board 18 attached to a bottom surface of said substrate; at least one signal via 6A in said substrate; said at least one signal via providing an electrical connection between a device electrode (on 12, connected to 22/24) of said chip and said printed circuit board;

A plurality of separate thermally conductive vias 6C in said substrate; each of said plurality of separate thermally conductive vias being coupled to a heat spreader 10C, said heat spreader being attached to said bottom surface of said substrate. See

that the plurality of thermally conductive vias provides a connection between said chip and said heat spreader (see layer 8C).

Selna also discloses:

- Said chip being a semiconductor chip
- Said substrate comprises organic/ceramic material (Col. 1, lines 15+)
- Said at least one signal via 6A provides an electrical connection between a bond pads 8A and said PCB 18, wherein said bond pad is electrically connected to said device electrode (through wire 22/24)
- Said signal via abuts the bond pad
- Said bond pad electrically connected to said device electrode by a bonding wire 22/24
- Said at least one signal via provides an electrical connection between said device electrode and a land 10A, said land being electrically connected to said PCB (through 14A)
- Said via abuts said land
- Said at least one signal/thermally conductive via comprises Copper (Col. 6, line 35), which is a thermally conductive material
- See that the heat slug/spreader of Selna is attached to the PCB

- A second plurality of signal vias 6B providing connection between a plurality of device electrodes (on 12, connected to 22/24) of said semiconductor chip 12 and said PCB
- Each of said bond pads is electrically connected to a respective one of the device electrodes
- Said second plurality of signal vias provide electrical connections between each one of said plurality of device electrodes and a respective one of said lands 10B, said lands being electrically connected to said PCB (through 14B)

However, see that Selna fails to specifically disclose:

- A MCM, or a second chip
- The second chip connected to a second heat spreader

Nonetheless, Terasawa discloses (see cover figure) first and second chips 2 connected to first and second heat sinks 33.

Therefore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to incorporate the teachings of Terasawa to those of Selna in order to provide individual heat sinks to individual chips such that better individual heat dissipation is provided.

Regarding **claim 7**:

See that Selna in view of Terasawa teach all the structural limitations above.

However, Selna in view of Terasawa fail to specifically disclose:

- Materials such as FR4 for the substrate

Nonetheless, materials such as FR4 are well known and widely used among semiconductor artisans. Also, see that such materials are not considered to be Applicant's invention. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate materials such as FR4 to the invention of Selna in view of Terasawa since they are readily available, they are well known and widely used in the art as explained above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lourdes C. Cruz whose telephone number is 703-306-5691. The examiner can normally be reached on M-F 10-6:30.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on 703-305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Lourdes C. Cruz
Examiner
Art Unit 2827


Lourdes Cruz
April 3, 2003


KAMAND CUNEO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800